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Implementing Teaching Program for Student Adolescent about Health Problems and its Effect on Academic Performance

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Abstract: **Adolescents are high risk for the development of problem behaviors that are distressing and socially disruptive that increases the morbidity and mortality rates during adolescence.**

The aim of this study was to determine the implementing teaching program for student adolescent about health problems and its effect on academic performance.

Subjects and Method: A quasi experimental research design was used in the study. The study was conducted at Technical Nursing Institute of Tanta University which affiliated to the Ministry of Higher Education and Police Technical Nursing Institute affiliated to the Ministry of Interior at Cairo city. 100 adolescent students who were selected by: a convenience sampling 50 students by simple randomization from the other sitting.

Three tools were used for data collection: structure questionnaire schedule to assess adolescents' demographic data, and knowledge about their risk behaviors, Main Integrated Adolescents Health Problems to assess adolescents' health risk and Grade Point Average to identify the factors that influence the academic performance.

Results showed that there were statistical significant differences among adolescent' sex, residence and BMI and their total health risk behaviors, there was highly statistically significant difference among adolescents' characteristics: age, child rank and body mass index regarding their grade point average,

The study concluded There was highly significant improvement among adolescents regarding to their total health risk behaviors after program implementation and there was highly statistically significant difference among adolescent health risk regarding their academic grades. Programs of multiple health risk behaviors for adolescents by community.

Recommendation: application of health education program for school health visitor teachers, family, must be taught the importance of healthy eating, benefits of engaging in physical activity, prevention of violence and tobacco use, ways to manage anger, and how to handle stress

Keywords: **Academic performance, Health problems, Student adolescent.**

1. INTRODUCTION

Adolescence is a period of physical, social and psychological development that involves stages of exploration with accompanying risk behaviors. It is a critical period of development during which a group of health risk behaviors may begin that can negatively affect health including both social and academic functioning. High risk behaviors are those that can have adverse effects on the development and well-being of adolescents, or that may prevent them from future development. High risk behaviors can significantly impact the lives of adolescents and those around them [(1)].

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Risk behaviors are voluntary actions that threaten to harm an adolescent's mental or physical health, or increase the likelihood illness, injuries and premature death. The CDC has identified six categories of risk behaviors in today's adolescent students. These include: behaviors that result in unintentional and intentional injuries, tobacco use, alcohol and other drug use, sexual behaviors that result in human immunodeficiency virus, other sexually transmitted diseases, and unintended pregnancy, dietary patterns that contribute to disease, insufficient physical activity [(2)].

Adolescents in Egypt accounted to nearly 19.1% or about 17.197 thousands from total population in 2016 [(3)]. And around 1.2 billion of the world population in 2017, or 1 in 6 of the world's population are adolescents aged 10 to 19 [(4)].

Building life skills in children and adolescents and providing them with psychosocial support in schools and other community settings can help promote good mental health.

Programs to help strengthen the ties between adolescents and their families are also important. If problems arise, they should be detected and managed by competent and caring health workers [(5)].

Academic success of is strongly linked with their health. Health-related factors such as hunger, physical and emotional abuse, and chronic illness can lead to poor school performance. Health-risk behaviors such as substance use, violence, and physical inactivity are consistently linked to academic failure and often affect students' school attendance, grades, test scores, and ability to pay attention in class. In turn, academic success is an excellent indicator for the overall well-being of adolescents and in predicting occupational and social success in adolescent's lifetime [(6)].

School nurses who take part in every level of school health services can play an important role in the assessment and management of health risks of students and in having students adopt healthy life behaviors, and that many nursing practices have a positive impact on attendance rates and overall education. These health services are designed to help with access or referrals by linking school staff, students, families, community, and health-care providers together to promote the health care of students in a healthy and safe school environment [(7)].

This study for adolescent students to reduce/eliminate the health problems that lead to serious health consequences and increase the morbidity and mortality rates during adolescent by providing information required to achieve the best health practice. School nurse play an important role in management of health problems of adolescent students [(7)].

Aim of the Study:

The aim of this study was to: Determine the implementing teaching program for student adolescent about health problems and its effect on academic performance.

Research hypothesis:

Adolescents' student knowledge and performance regarding their health problems which effect on academic performance expected to be improved after implementation of teaching program.

2. SUBJECTS AND METHOD

Research Design: A quasi experimental research design was used in the study

Setting: This study was conducted at: Technical Nursing Institute at Tanta University affiliated to the Ministry of Higher Education and Police Technical Nursing Institute affiliated to the Ministry of Interior at Cairo city.

Subjects: A convenience sampling was composed of available adolescent students in previous mention setting 100 students who agree to participate in the study through the academic year 2015/2016.

Tools of data collection:

Three tools were used to collect the necessary data.

Tool 1: A structured questionnaire schedule: It was used to assess adolescent students' knowledge about health risks. It was divided into two parts:

Part I: Socio demographic data and students' knowledge assessment structure questionnaire schedule to assess adolescents' social status that affects his or her academic performance as the followings:

a) Socio demographic characteristics questions among adolescents as: adolescent's age, sex, religious, height, weight, residence area, and reading activities.

b) Family characteristics questions as: parents' age, level of education, occupation, number of individuals in the family, monthly family income, and level of housing condition.

c) School characteristics questions as: number of students in the class, ways of teaching, library books, and how well schools are equipped for adult life.

Part II: Adolescent student knowledge assessment questionnaire schedule: it was developed by the researcher after reviewed of literature to assess students' knowledge about:

a. Nutritional status: food elements, sources of food elements, functions of food elements, daily requirement for individual, danger of nutritional disorder, and importance of physical activity.

b. Danger of drug used and its effect on adolescent health.

c. Tobacco use and its effect on adolescent health.

d. Accident prevention and measures for safety.

e. Sleep: daily sleep hours, factors affecting sleep disorder, the importance of sleep and rest.

f. Sexual behaviors, danger of early pregnancy, and sexual transmitted diseases.

- **Scoring system for adolescent students' knowledge was as** following a questionnaire including 4 sections with the total number 27 questions: it was covered all socio demographic characteristics that affect adolescents (16 items), adolescent knowledge (11 items).
- Scoring system was as following:
- Correct and complete answer was scored (1).
- Incorrect and incomplete answer scored (0).
- **The percent of total scoring system for adolescent' knowledge were classified as follows:**
- Less than 60% was considered poor knowledge.
- 60% - 70% was considered fair knowledge.
- More than 70% was considered good knowledge

Tool II: Main Integrated Adolescents Health problems: it was developed by Corral (2013) [8] and was modified by the researcher after reviews of literature to assess the prevalence of health risk behaviors and assess whether health risk behaviors increase, decrease, or stay the same overtime, it contain six types of health-risk behaviors that contribute to the leading causes of disability among adolescent including:

a. Behaviors that contribute to unintentional injuries and violence.

b. Sexual behaviors and sexual transmitted diseases including HIV infection.

c. Drug abuse as narcotic and alcohol.

d. Unhealthy dietary behaviors.

e. Inadequate physical activity.

f. Smoking, tobacco.

- **Scoring system for adolescents' health problems was as following** A questionnaire including 10 sections with the total number 103 questions: it was covered adolescent risk behaviors, behaviors leading to intentional or unintentional injuries (12 items), smoking (6 items), alcohol and other drug used (9 items), nutritional habits (11 items), physical activity (5 items), hygiene related behavior (4 items), anxiety levels (18 items), sleep disturbance (10

items), emotional disturbance (15 items), educational disturbance (10 items), health education and health promotion (3 items)

- **Scoring system of adolescent health problems was as the following:**
- Three levels of scoring for each question were used:
- A score of (0) for never response.
- A score of (1) for sometimes response.
- A score of (2) for usually response.
- **The percent of total scoring system for adolescent' risk behaviors as the follows:**
- 0 % was considered no risk
- 1 % - < 50%was considered low risk.
- 50% - < 75% was considered moderate risk.
- > 75% was considered high risk.
- **Tool III**: **Grade Point Average** it was developed by National Centers for Educational Statistics (2014)[9] and translated by the researcher to identify the factors that influence the academic performance of adolescents and examine the relationships between health behaviors and academic performance which is calculated multiplying the course GPA credit the result is not rounded to the nearest decimal point
- **Scoring system for adolescent academic performance** was as following**:** multiply each grade value by the unit credit points sum the resulting values (weighted GPA unit score) sum the unit credit points divide the sum of the weighted GPA unit score by the sum of the unit credit points calculate to three decimal points**.**
- **Scoring system for adolescent academic performance was as following:**
- Incorrect and incomplete answer scored (0).
- Correct and complete answer scored (1).
- **The total scoring system for adolescent' academic performance** were calculated and classified as following**:**
- < 60% was considered poor performance.
- 60% – 79% considered fair performance.
- ≥ 80% was considered good performance.

Method:

1-Administrative Process:-

An official permission was obtained from faculty of nursing at Tanta University to responsible directors of technical nursing Institute and police nursing institute, explaining the aims of the study and the methods of data collection to obtain the permission and help

2- Ethical Considerations:

- Nature of the study didn`t cause any harm or pain to the participating of the study.
- Confidentiality and privacy were taken into consideration regarding the data collection.

3- Tools Development:

Study tools was developed by the researcher after review the related literature and used to assess adolescents' knowledge and practices about their risk behaviors and their academic achievement. Tool (I), tool (II) and tool (III) were used before, immediate and after program implementation.

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4- A Pilot Study:

A pilot study was carried out before starting the data collection. It was done on a sample of 10% of the adolescents to test applicability, validity, and liability of the study tools and required modification was done in the form of addition or omission of some questions. It was included in the study sample.

5- Content validity of the tools:

The tools of the study had been tested for content validity by 5 jury experts in the field of Pediatric Nursing and modification was carried out accordingly.

Phases of the study:

1- Assessment phase:

- Initial interview with adolescent students was done at Technical Nursing Institute at Tanta city which affiliated to Ministry of Higher Education and Police Technical Nursing Institute at Cairo city which affiliated to Ministry of Police to assess adolescent students' knowledge about health problems by using Tool I, II, and III.

2- Planning phase:

- Program was developed by researcher, priorities goal and expected outcomes criteria were formulated, and audio visual materials was used such as power point presentation, lectures, discussion, and posters.

3- The program implementation phase:

- The implementation phase include eight teaching sessions for adolescent students was implemented individually or in group according to availability of students, and the number of adolescents in each session include 10 adolescents and it was as the following:

- **Session (1):** Adolescents' normal changed that occurs according to the growth and development.
- **Session (2)**: Health problems as: unintentional injury, suicide and depression, tobacco, alcohol and drug uses, nutrition, and physical activity, factors that increase the prevalence of mortality and morbidity during this age.
- **Session (3)**: Nutrition status, danger of nutritional disorder, importance of balanced diet, and of physical activities types and its importance.
- **Session (4)**: Danger of drug used, tobacco use and its effect on adolescent health.
- **Session (5)**: Accident prevention, and measures for safety.
- **Session (6):** Importance of sleep and rest, adequate hours during a day and night, measures for comfort sleep.
- **Session (7):** Dangers of sexual behaviors, dangers of early pregnancy, and sexual transmitted diseases.
- **Session (8):** Guide for adolescents on the management and treatment of health risks and role of the nurse of adolescents with injury, suicide, drug use, and (HIV) on admission in hospital.
- Each session was taken 20- 30 minutes and it was carried out on three successive days and 1- 3 groups per day.

4- Evaluation phase:

- The program implementation was evaluated after one month once completion of sessions using Tool (I), Tool (II) and Tool (III).
- Data were collected over a period of 6 months starting from November 2015 till the end of April2016.

Statistical analysis:

The collected data were organized, tabulated and statistically analyzed using the mean, Statistical Package for Social Science Software (SPSS version 20). For quantitative variables mean, range and standard deviation were calculated. Chi-square student, t-test, paired t-test, linear correlation coefficient. Chi-square it's the hypothesis that the row and column variables are independent, without indicating strength or direction of the relationship. Fisher exact test was used to

compare knowledge and practice before and after. Correlation between variables was evaluated using Pearson's correlation coefficient (r). Significance was adopted at $p < 0.05$ for interpretation of results of tests of significance.

3. RESULTS

- **Table (1):** As shown in this table of socio demographic characteristics of the present study among studied adolescent students it revealed that, more than three quarter (76%) were ages 17- 18 years old with a mean age (17.5 $\pm$ 2.4). Concerning adolescents' sex, it was clear that more than half of the studied sample (55%) were female. While more than two fifth (44%) were first child and only (6%) was above the third child. As regard the residence area it was found that more than two third (68%) lives in rural area.

- Regarding the body mass index it was evident that more than half of studied sample (59%) had (65- 84kg) in weight respectively while (170- 195 cm) in height. Additionally more than three fifth of studied adolescent (62%) were attended to educational training program.

- **Table (2):** This table showed that, more than three third (64%) of studied adolescent mother' age of 35 years or less, nearly half (45%) were university level of education, and more than three fifth (67%) have house wives, in addition more than three fifth (63%) of studied adolescent father age more than 40 years old, more than two fifth (43%) were university educational level, majority of them (88%) working. Moreover more than three fifth (63%) were live with father and mother, and more than two fifth (44%) have more than 3500 pounds in their monthly income. Nearly three quarter (74%) have family size less five people or less.

- **Table (3):** In relation to school characteristics it was cleared that, more than three quarter (80%) of studied adolescents mention that school had taught them things which could be useful in a job, the majority of them (86%) after one month told that the teacher focused on questions that encourage students to participate well compared with (77%) before program, and the majority of them (98%) were using the net for educational purposes.

- There was a statistical significance difference among adolescent students with ($P<0.05$) related to teacher characteristics, library resources and school characteristics.

- **Table (4):** illustrates that the total knowledge regarding unhealthy behavior before, immediate and one month after program intervention. More than half of them (58%) had good knowledge after one month program intervention compared by (48%) before program and 70% immediate program intervention.

- **Table (5):** Concerning adolescents' knowledge about unhealthy behaviors before, immediate and after implementation of teaching program, it is obvious that there were statistically significance differences for adolescents' knowledge regarding the danger of nutritional disorder, the importance of balanced healthy diet, daily needs, The importance of physical activity and the danger of drug used.

- **Table (6):** demonstrated that, there was highly significant improvement among adolescent students regarding their total health risk behaviors immediate and one month after program implementation (P value < 0.001). Also it was cleared that, before program (51%) had severe risks compared by 24% one month after program intervention. Only (6%) had on risks before program compared by 13% immediately after program and 19% one month after program intervention.

- **Table (7):** showed that the relation between studied adolescent students' demographic data and their post total risk behaviors score. It is obvious that, there were no statistically significant relation between adolescents' age and health risk, more than three fifth (68.4%) of studied adolescents 17- 18 years have no risk. In relation to studied adolescent students' sex and their post total risk behaviors score. It is cleared that, there was highly statistically significant relation between adolescents sex and health risk, more than three quarter (89.5%) of studied adolescents male have no risk. Regarding to the relation of studied adolescent students' his position in the family and their post total risk behaviors score. It is cleared that, there was more than one quarter (26.3%) of studied adolescents was first child that have no risk. As regards the relation of studied adolescent students' residence and their post total risk behaviors score. It is cleared that more than three fifth (63.2%) of studied adolescents were from urban residence that had no risk. In relation to studied adolescent students' body weight and their post total risk behaviors score. It is obvious that, there was highly statistically significant relation between adolescents' weight and health risk, more than three fifth (63.2%) of studied adolescents were normal weights having no risk. As regards the relation of studied adolescent students' attended to any educational program and

their post total risk behaviors score. It is cleared that, there was more than three quarter (89.5%) of studied adolescents were attending educational program have no risk.

- **Table (8):** point up that there were no statistically significant relation between parents' age and adolescents' total health risk with (P value > 0.05) before and after program intervention. Additionally there was statistically significant relation between parents' educational level and adolescents' total health risk with (P value < 0.05) before and after program intervention. Moreover there was statistically significant relation between parents' occupations and adolescents' total health risk with (P value < 0.05) before and after program intervention. Furthermore there was statistically significant relation between adolescents' live with and their total health risk with (P value < 0.05) before and after program intervention. Also there was statistically significant relation between family monthly income and adolescents' total health risk with (P value < 0.05) before and after program intervention. As well as there was statistically significant relation between family size and adolescents' total health risk with (P value < 0.05).

- **Table (9):** clarified the relation between studied adolescent students' demographic data and their grades. It was noticed that, there were highly statistically significant difference with (P <0.001) between adolescent age and their grades. Regarding sex, more than half of studied adolescent's samples (55.3%) are female that have grade A average. In relation to number of child for the family, more than two fifth (48.2%) are the first child and have grade (A) average. As regards adolescent weight, there were statistically significant difference (<0.001) between adolescent weight and their grades more than three quarter (81.2%) were normal weight that have grade A. Regarding adolescent attended to any educational program, more than half (65.9%) were attending educational program had grade A average.

- **Table (10):** indicates that, there were highly statistically significant difference with (P < 0.001) among adolescents' health risk and their academic grades, more than one fifth of studied adolescent students (22%, 28.2%) respectively have no and mild risks their grade point average (A) while all of them (100%) had severe risk and grade (C).

Table (1): Percentage distribution of studied adolescent students related to their socio-demographic characteristics

Socio-Demographic characteristics of adolescents	**(n= 100)**	
	No	**%**
Age (years)		
15 < 17	24	24
17 – 18	76	76
Mean ± SD	17.5 ± 2.4	
Sex		
Male	45	45
Female	55	55
Birth order:		
First	44	44
Second	30	30
Third	20	20
> third	6	6
Residence		
Rural	68	68
Urban	32	32
Weight in kg		
45- 64	37	37
65- 84	59	59
85- 100	4	4
Mean ± SD	67.8 ± 3.2	
Height in cm		
150- 169	43	43
170- 195	57	57
Mean ± SD	160.4 ± 9.74	

Attend to any educational training program:		
Attended	62	62
Not attended	38	38

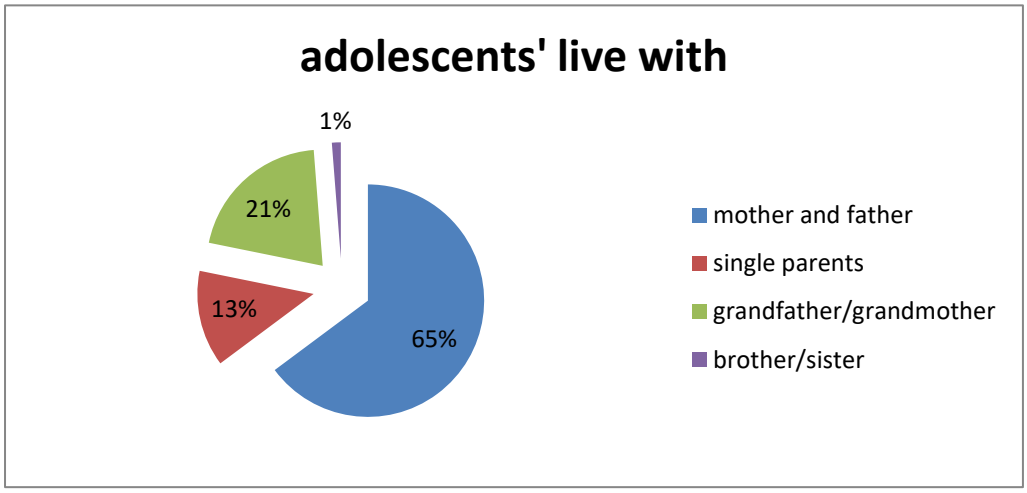

Figure (1): Percentage distribution of studied adolescent students related to their parents characteristics

Table (2): Percentage distribution of studied adolescent related to their school characteristics

School Characteristics	(n = 100)				X^2	P
	Before		One month after			
	No	%	No	%		
School qualities:						
Prepared for the future	46	46	69	69		
Wasted of time	57	57	45	45	5.583	0.065
gave confidence to make decisions	40	40	60	60		
taught things which could be useful in a job	80	80	80	80		
Teachers qualities:						
listen well to what students saying	69	69	74	74		
explained what is expected of the students	56	56	76	76		
make sure that students focus during the lesson	66	66	86	86	17.65	0.002*
gave grades to students						
gave students the opportunity to ask questions	65	65	78	78		
focused on questions that encourage students to participate well	46	46	69	69		
	77	77	86	86		
library resources						
Borrowed books for entertainment	67	67	80	80		
Borrowed books for educational purposes	48	48	72	27		
Worked on scientific research					14.44	< 0.05*
Read magazines and newspapers	53	53	79	79		
Used the net for educational purposes	29	29	38	38		
	82	82	98	98		

P value >0.05 in significant
P-value <0.05 Significant

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Table (3): Percentage distribution of studied adolescent related to their knowledge assessment

Adolescents' knowledge about unhealthy behavior	(n= 100)						X^2	P
	Before		Immediate		1 month after			
	No	%	No	%	No	%		
Danger of nutritional disorder								
Psychological symptoms and low self-esteem	11	11	7	7	9	9		
Health risks such as heart disease	28	28	11	11	20	20	10.87	0.004*
Lack of concentration and poor performance in exams	16	16	8	8	8	8		
Increase in weight and weight	12	12	11	11	12	12		
All the above	39	39	63	63	51	51		
The importance of balanced health diet	10	10	5	5	8	8		
Get a great look and feel	9	9	6	6	6	6	18.653	0.000*
Supply of power to the body crisis								
Activity and vitality	2	2	4	4	4	4		
Development of immune system and disease resistance	11	11	8	8	10	10		
Growth and tissue building	20	20	2	2	10	10		
All the above	48	48	75	75	62	62		
Daily needs								
Girls 2100 - 2400 calories/ day	13	13	7	7	9	9		
Boys 2400 - 3000 calories/ day	17	17	8	8	11	11	14.973	0.001*
800- 1200 mg of calcium / day	8	8	6	6	8	8		
10- 18 mg of iron / day	17	17	10	10	14	14		
All the above	45	45	69	69	58	58		
The importance of physical activity	7	7	2	2	2	2		
Improve physical fitness	6	6	3	3	5	5	10.608	0.005*
Improving bone health	9	9	5	5	5	5		
Energy balance and weight control								
Relieve life stress	12	12	3	3	2	2		
Acquisition of moral turpitude and responsibility	8	8	4	4	4	4		
All the above	68	68	83	83	82	82		
Danger of drug used								
lead to failure in the glands	2	2	0	0	2	2		
Psychological problems	5	5	3	3	3	3		
Diseases such as heart	11	11	6	6	7	7		
Malnutrition diseases	9	9	3	3	5	5	19.645	0.001*
Risk of accident and death	10	10	1	1	1	1		
All the above	63	63	88	88	82	82		

P-value <0.05 Significant

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Table (4): Percentage distribution of studied adolescent related to their knowledge assessment

Adolescent student knowledge about unhealthy behavior	Knowledge of the studied adolescents before immediate and after one month (n= 100)						X^2	P
	Before		Immediate		1 month after			
	No	%	No	%	No	%		
Smoking health risks								
Respiratory system diseases, heart and cancer sometimes	9	9	4	4	7	7		
Stomach problems including ulcers	10	10	4	4	4	4	8.507	0,014*
Affects brain function	20	20	10	10	10	10		
Causes premature aging	20	20	12	12	12	12		
All the above	41	41	70	70	53	53		
Measures for safety:								
Prevent the use of mobile phones while walking	11	11	7	7	9	9		
Prevention of drug use	18	18	12	12	10	10		
Treatment of mental problems	11	11	9	9	8	8		
Distance from sexual relations	10	10	9	9	10	10	10.178	0.006*
Taking measures for peace in the home, school and roads	12	12	8	8	12	12		
All the above	39	39	55	55	51	51		
Importance of sleeping and resting body:								
Important for adolescent physical and mental health	10	10	8	8	8	8		
Prevention of health problems	11	11	5	5	8	8		
Accident Prevention	11	11	9	9	7	7	3.408	0.182
Helps increase the ability to attain academic achievement	20	20	10	10	15	15		
All the above	48	48	68	68	62	62		
Risks of early pregnancy:								
Health problems of mother and child	13	13	8	8	9	9		
Increase the mortality rate at this age	17	17	11	11	11	11	17.56	0.002*
Presentation of injuries and abortion	8	8	6	6	8	8		
Problems during delivery	17	17	10	10	14	14		
All the above	45	45	65	65	58	58		
Sexual transmitted diseases:								
Gonorrhea, and syphilis	7	7	0	0	2	2		
Hepatitis B	6	6	3	3	5	5		
Herpes	9	9	2	2	5	5	5.46	0.065
HIV, HPV	8	8	3	3	4	4		
All the above	68	68	92	92	88	88		
Risks of sexual behavior:								
Exposure to epidemic disease	5	5	1	1	3	3		
Exposure to reproductive disease	9	9	2	2	5	5	8.584	0.072
Death due to AIDS	10	10	2	2	6	6		
All the above	76	76	95	95	86	86		
Mean total adolescent knowledge	48		70		85			

P value >0.05 in significant
P-value <0.05 Significant

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Table (5): Percentage distribution of studied adolescent related to their total health problems

Total health problems	(n = 100)						Chi-square test	
	Before		Immediate		1 month after			
	No	%	No	%	No	%	X2	P-value
No health problem	6	6	13	13	19	19	18.879	< 0.001*
Mild health problem	16	16	20	20	25	25		
Moderate health problem	27	27	35	35	32	32		
Severe health problem	51	51	32	32	24	24		

P-value <0.001 highly significant

Table (6): Relation between studied adolescents' demographic characteristics and their post total health problem

Socio-Demographic characteristics	No problem (N=19)		Mild problem (N=25)		Moderate problem (N=32)		Severe problem (N=24)		Chi-square	
	No	%	No	%	No	%	No	%	X^2	p-value
Age (years)									3.295	0.348*
15 < 17 y	6	31.6	8	32.0	7	21.9	3	12.5		
17 - 18 y	13	68.4	17	68.0	25	78.1	21	87.5		
Sex									20.196	<0.001**
Male	17	89.5	11	44.0	9	28.1	8	33.3		
Female	2	10.5	14	56.0	23	71.9	16	66.7		
Birth order									14.876	0.048*
First	5	26.3	9	36.0	13	40.6	17	70.8		
Second	6	31.6	9	36.0	10	31.3	5	20.8		
Third	6	31.6	6	24.0	8	25.0	0	0.0		
>third	2	10.5	1	4.0	1	3.1	2	8.3		
Residence									15.059	0.002*
Rural	7	36.8	16	64.0	23	71.9	22	91.7		
Urban	12	63.2	9	36.0	9	28.1	2	8.3		
Body mass index									36.435	<0.001**
Normal	12	63.2	17	68.0	22	68.8	20	83.3		
Obese	7	36.8	8	32.0	10	31.3	4	16.7		
Educational program									8.710	0.034*
Attended	17	89.5	16	64.0	16	50.5	13	54.2		
Not attended	2	10.5	9	36.0	16	50.5	11	45.8		

P value >0.05 in significant

P-value <0.05 Significant

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Table (7): Relation between family characteristics of studied adolescents' and their post total risk behaviors score

Family characteristics	(n= 100)									
	No problem (n=19)		Mild problem (n=25)		Moderate problem(n=32)		Severe problem (n=24)		Chi-square	
	No	%	No	%	No	%	No	%	x2	p-value
Data for the mother										
Age (years)										
≤35 years	12	63	17	68	22	68.7	14	58.3	29.960	0.054
>35 years	7	37	8	32	10	31.3	10	41.7		
Education level										
Illiterate	3	15.8	6	24	15	46.9	12	50		
Qualified average	7	36.8	8	32	9	28.1	8	33.3	23.002	0.000*
University	9	47.4	11	44	8	25	4	34.7		
Occupation										
House wives	11	58	14	56	13	40.6	9	37.5	18.033	0.000
Worker	8	42	11	44	19	59.4	15	62.5		
Father data										
Age (years)										
≤40 years	10	52.6	14	56	14	43.8	11	45.8	7.987	0.018
>40 years	9	47.4	11	44	18	56.2	13	54.2		
Education level										
Illiterate	8	42.1	9	36	13	40.6	10	41.7		
Qualified average	6	31.6	7	28	11	34.4	9	37.5	3.505	0.0001
University	5	26.3	9	36	8	25	5	20.8		
Occupation										
worker	11	57.9	15	60	16	50	14	58.3	49.958	0.000
Not worker	8	42.1	10	40	16	50	10	41.7		
Live with:										
Mother and father	10	52.6	8	32	11	34.4	5	20.8		
Single parents	7	36.9	10	40	18	56.2	13	54.2	7.301	0.0001
Grandfather or grandmother	2	10.5	7	28	3	9.4	6	25		
Monthly income										
< 1500 LE	3	15.8	6	24	11	34.4	9	37.5		
1500 ≤2500 LE	2	10.5	7	28	9	28.1	6	25	21.018	0.000*
2500 ≤3000 LE	6	31.6	4	16	5	15.6	5	20.8		
>3500 LE	8	42.1	8	32	7	21.9	4	16.7		
Family size										
≤ 5 person	11	57.9	15	60	11	34.4	14	58.3	30.655	0.000
> 5 person	8	42.1	10	40	21	65.6	10	42.7		

P-value >0.05 in significant
P-value <0.05 Significant

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Table (8): Relation between studied adolescent students' demographic characteristics and their grades

Adolescent' socio demographic characteristics	Grade A ≥80 good performance (n=85)		Grade B 60- 79 fair performance (n=12)		Grade C < 60 poor performance (n=3)		X^2	P
	No	%	No	%	No	%		
Age (years)								
15 < 17 years	10	11.8	11	91.7	3	100.0	46.600	<0.001
17 – 18 years	75	88.2	1	8.3	0	0.0		
Sex								
Male	38	44.7	5	41.7	2	66.7	0.626	0.731
Female	47	55.3	7	58.3	1	33.3		
Birth order								
First	41	48.2	3	25.0	0	0.0		
Second	26	30.6	4	33.3	0	0.0	54.107	<0.001
Third	17	20.0	3	25.0	0	0.0		
>third	1	1.2	2	16.7	3	100.0		
Body mass index								
Normal	69	81.2	2	16.7	0	0.0	28.825	<0.001
Obese	16	18.8	10	83.3	3	100.0		
Educational program								
Attended	56	65.9	9	75.0	3	100.0	1.857	0.395
Not attended	29	34.1	3	25.0	0	0.0		

P value >0.05 in significant
P value <0.05 Significant

Table (9): Relation between health problems of studied adolescent students' and their grades

Total health problems	Grade A ≥ 80 good performance (n=85)		Grade B 60- 79 fair performance (n=12)		Grade C < 60 poor performance (n=3)		Chi-square test	p-value
	No	%	No	%	No	%		
No health problem (n=19)	19	22.4	0	0.0	0	0.0	31.633	<0.001
Mild health problem (n=25)	24	28.2	1	8.3	0	0.0		
Moderate health problem (n=32)	21	24.7	11	91.7	0	0.0		
Severe health problem (n=24)	21	24.7	0	0.0	3	100.0		

P-value <0.001 highly significant

4. DISCUSSION

The findings of the present study showed that, the majority of adolescent students were from 17- 18 years, this may be due to these age demonstrated different pattern of risk behaviors, these results harmony with **Khurshid & Aurangzeb (2012)** [10] who stated that the majority of the respondents were between the age of 16 and 18 years when the adolescent problems are manifested.

Result of this study indicated that, more than half of the studied adolescents were female students, this may be due to female adolescents were less likely to engage in problem behaviors in comparison with male adolescents and girls more likely to participated in the study than boys, these result was in differed with **Martin et al. (2011)** [(11)]who stated that male students were more likely than female students to report three of the five health-risk behaviors that contribute to unintentional injuries.

Regarding the adolescent's birth order, the present study revealed that more than two fifth of studied adolescents were the first child, this may be due to that the first child have more responsibilities than the older one, these result was contradicted with **Stanton et al. (2014)** [(12)] who stated that later-born siblings are involved in more risky behavior, have a less healthy life style and worse mental health in older age.

However more than two third of studied adolescents were from rural residence, this may be due to rural adolescents were less health services to reach better health, these result was in agreement with **Andrade et al. (2014)** [(13)] who stated that urban adolescents had better physical fitness than rural adolescents.

Concerning body mass index the result revealed that more than two third of studied adolescents have normal body weight, this may be due to the police institute make sure that every students must have normal weight and height, these result is not in harmony with **Becton et al. (2012)** [(14)] who stated that adolescents and young adults who are prone to obesity suffer physically and psychologically.

The results of the present study clarified that the majority of studied adolescents attended to educational program, this may be due to a comprehensive, well-coordinated school health program can promote the optimal physical, emotional, social, and educational development of students. Because the health of students is inextricably linked to educational achievement, it is critical that schools promote health. Schools can provide the nurture and support needed to facilitate the adoption of health-enhancing behaviors, these in accord with **Ranjbar et al. (2010)** [(15)] who stated that there were significant improvements of adolescents' awareness after the educational intervention.

Related to the adolescents live with this study showed that, more than three fifth of adolescent students were live with their father and mother, this may be due to the importance of family cohesion, these result was in harmony with **Patton et al. (2012)** [(17)] who mentioned that parents are among those who play an important role in the life of an adolescent and continue to have a significant influence.

Concerning the school characteristics, the study post program showed that, the majority of studied adolescent students mention that school had taught them things which could be useful for a job, this may be due to schools are the place for building the future generation, these result was in agreement with **Flay (2014)** [(19)] who stated that school protects against a wide range of health risk behaviors.

In the same line there was statistically significant difference among adolescents regarding teacher qualification, these results was accord with **Wayne & Youngs (2013)** [(20)] who mentioned that there is significant relationship between students' perception of teachers' knowledge of subject matter and academic performances.

Also the study post program showed that, the majority of studied adolescent students were used the net for educational purposes, this may be due to texting message has become teens preferred method of communication, these results was contracted with **Harris SK et al. (2017)** [(21)] who mentioned that social media use offers important benefits to adolescents, such as health promotion, communication, education, and entertainment; it also increases risks for exposure to cyber bullying, engagement in "sexting" and depression.

In relation to adolescent' knowledge there were statistically significant differences regarding the danger of nutritional disorder, this may be due to good knowledge gives the chance to change the sedentary life style, these result was in harmony with **Briggs et al. (2010)**[(22)] who stated that comprehensive, sequential nutrition education using the classroom and the lunchroom can reinforce healthful eating behaviors. Nutrition education should be part of a comprehensive school health education curriculum.

Also there were statistically significant differences of adolescents' knowledge regarding the importance of balanced health food, these result was discord with **Cairo et al. (2014)** [(23)] who mentioned that Knowledge and attitude about balanced diet had no association with microcytic- hypochromic anemia. In contrast, the practices of balanced diet had a significant association with microcytic-hypochromic anemia**.**

On the subject of adolescent' knowledge there were statistical significant differences regarding the importance of physical activity, this may be due to physical activity strength muscle and burn excess fat to control of body weight, these result was in accord with **Kelishadi et al. (2010)** [24] who declared that planning and managerial problems, lack of resources, insufficient knowledge and attitude, social and cultural circumstances and gender had an effect on the level of physical activities among adolescent and young adult.

Moreover there were no statistical significant differences among adolescents' knowledge regarding the importance of sleeping and resting body, this may be due to adolescents today sleepless and experience more daytime sleepiness symptoms as compared to previous generations, these result was in difference with **Ma et al. (2015)** [25] who declared that the possible adverse link of late timing of weekend sleep with the maturing adolescent brain and school performance.

Concerning distribution of students adolescent related to their total health risks it was clear that there was highly significant improvement in adolescent's health post program implementation, it may be due to that adolescence is the period of storm, these result was in accord with **Banspach et al. (2016)** [26] who mention that Promoting healthy behaviors during adolescence can lead to healthy lifestyle and behavioral choices in adulthood thereby preventing major chronic diseases and leading to less disability and greater health-related quality of life.

Concerning the relation between studied adolescent students' demographic data and their post total risk behaviors it was visible that there was no statistically significant differences among adolescents' age regarding their risk behaviors,, these result was in discord with **Avrett et al. (2011)**[27] who revealed that when adolescents grow older, they get more involved in risky behaviors.

However there was highly statistically significant among adolescents' sex regarding to their risk behaviors, it may be due to that different cultures treat girls and boys differently, which subsequently affect their socialization and various behaviors, these result was in contract with **Atav & Spencer (2012)** [28] who revealed that boys are more likely to be injured and girls have a higher risk of being hospitalized for mental conditions in adolescence.

Moreover there was no statistically significant differences among adolescents' birth order regarding their total risk behavior, it may be due to first born child have more parental care, these result was in accord with **Pavan (2015)** [29] who suggest that later-born siblings are involved in more risky behavior, have a less healthy life style and worse mental health in older age.

Also there was statistically significant between mothers' occupation and adolescent' risk behaviors, this may be due to working mothers spend less time for emotional support, continuous supervision, encouraging and helping with school activities, these result was in accord with **Aughinbaugh & Gittleman (2014)**[30] who mention that comparable negative associations between mothers' occupation and risky behaviors. Occupation is associated with higher probability of being busy.

Although there was statistically significant between family monthly income and adolescent' risk behaviors, it may be due to the increased family income provide all facilities to improve adolescents' health, these result was in accord with **Mancini & Huebner (2014)** [31] who mention that adolescent with high family income are more likely to afford cigarettes than children with low income.

However there was no statistically significant between adolescents' sex and their total grades, it may be due to there is no difference in academic performance between boys and girls, these result is different with **Tsinidou et al. (2010)** [32] who mentioned that there is a significant difference in relation between boys and girls school students with reference to overall educational adjustment.

Moreover there was highly statistically significant between adolescents' birth order and their total grades, it may be due to that the first birth or the older child is usually advantaged by a good deal of attention and warmth, these result was in concord with **Galotti et al. (2016)**[33] who mentioned that there was more significant outstanding academic performance amongst first birth children.

Meanwhile there was highly statistically significant between adolescents' body mass index and their total grades, it may be due to proper nutrition has a direct effect on student performance and behavior in school. That nutrition has a direct effect on neurotransmitters which are important in sending messages from the body to the brain, these result was in

contract with **Taras & Potts-Datema (2015)** [34] who stated that BMI has little negative and direct relationship with school contentment, but a stronger direct negative relationship with academic achievement.

Regarding the relation between health risk behaviors of studied adolescent students' and their grades, it was clear that there was highly statistically significant between adolescent health risks and their educational grades, this may be due to health-related factors such as hunger, physical and emotional abuse, and chronic illness can lead to poor school performance, these result was in concurrence with **Symons et al. (2015)** [35] who showed a negative association between health-risk behaviors and academic achievement among high school students, this means that students with higher grades are less likely to engage in health-risk behaviors than their classmates with lower grades, and students who do not engage in health-risk behaviors receive higher grades than their classmates who do engage in health-risk behaviors.

5. CONCLUSION

Based on the findings of the present study, it is concluded that adolescent students showed an improvement in adolescents' health. There was highly significant improvement among adolescents regarding to their total health problems after program implementation.

Recommendation: application of health education program for school health visitor teachers, family, must be taught the importance of healthy eating, benefits of engaging in physical activity, prevention of violence and tobacco use, ways to manage anger, and how to handle stress.

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